Index to Instrumentation Technology, Volume 21, 1974

(News items are denoted by "N" after the page number)

Subject — **Issue, Page**

Accuracy & calibration
Jan 33,39; Mar 45; Apr 35,43; Jun 45; Jul 16N; Aug 41; Oct 14N,50,52,53; Nov 40.

Advanced control
Feb 36; Apr 7N,35; May 29,42; Jun 52; Sep 14N,74; Oct 8N.

Alarms (see Monitors and alarms)

Analog control
Jan 39; Feb 36,39; Mar 9N,37; Apr 7N,46; May 29,52; Jun 7N,31,41,52; Jul 55; Aug 7N,16N; Sep 14N,60; Oct 8N,35; Nov 31; Dec 30.

Analyzers
Jan 43; Feb 9N,27,32,44; Mar 37,45,50; Apr 41; May 52; Jun 7N,45,52; Jul 16N; Aug 16N,33; Nov 12N; Dec 16N,20N,45.

Batch control
Mar 39; May 29; Jun 31; Aug 38; Sep 14N,49.

Biomedical instruments
Jan 10N; Apr 52; Jul 24N.

Calibration (see Accuracy and calibration)

Circuit design and analysis
Mar 37; Apr 52; May 50; Jun 50,52; Jul 51,55; Oct 52,53.

Computer control
Mar 10N; Apr 8N; May 42; Jun 7N,31; Jul 22N; Aug 7N,16N; Sep 10N,14N,70; Oct 39; Nov 5N; Dec 41.

Computer programming
Mar 10N,39; Jul 22N; Aug 16N; Sep 65,70; Oct 39.

Computers, analog
Jan 39; Feb 36,39; Oct 8N.

Computers, digital
Jan 6N; Mar 10N; Jul 22N; Sep 65,70,74; Oct 39,53; Dec 41,50.

Conductivity
Mar 45; Apr 35; Jun 52; Nov 35.

Control systems theory
Feb 36,39; Apr 35; May 29,42; Jun 36,41; Jul 55.

Cryogenics
Jan 33; Aug 41; Nov 18N,35.

Data acquisition
Feb 9N,27; Jun 36; Jul 16N; Aug 16N,49; Sep 65,70,74; Oct 39,53; Dec 41,45.

Digital control
Mar 9N,39; Apr 7N; Jun 7N; Aug 7N,16N; Sep 14N,65; Oct 39; Dec 50.

Dynamics
Feb 39; Apr 35; May 29,50; Jun 41; Oct 39,52.

Economics
Jan 5N; Mar 16N; Apr 21N; Jul 9N; Aug 14N,21N,44; Sep 9N; Oct 8N,39; Dec 16N,41.

Education & training
Feb 25,39; Apr 12N; May 38; Jun 10N,26; Sep 60,70.

Error analysis
Jan 33; Mar 45; Apr 43; Jun 45; Jul 33; Aug 41,48,49; Oct 14N,46,50.

Flow
Mar 29; May 29,50; Jul 33,56; Aug 38,49; Sep 49; Nov 31; Dec 30,41.

Installation
Mar 29,49; Apr 46; May 35; Jun 50; Aug 33; Sep 14N,65; Oct 7N,35; Nov 5N; Dec 30.

Interface equipment
Mar 10N; May 42; Jul 22N; Sep 14N,65; Oct 39; Nov 5N; Dec 50.

ISA
Feb 50; Apr 7N; May 38; Jun 7N; Jul 24N,33; Aug 7N,16N; Dec 9N.

Level
May 29; Jun 41; Sep 49; Dec 30.

Logic
Mar 39; Aug 49; Sep 65,74; Oct 53.

Maintenance
Apr 46; May 35,42; Jun 50; Jul 51; Aug 33,44; Sep 14N,70; Nov 27,40; Dec 30.

Marketing
Jan 5N,6N,10N,43; Mar 16N,29; May 5N,10N; Jul 9N,24N; Aug 14N,21N; Sep 14N,49; Oct 8N; Nov 12N; Dec 16N.

Materials handling
Mar 39; May 50,52; Aug 38; Oct 35; Nov 31.

Metrology
Jan 33; Mar 45; Apr 43; Aug 41; Oct 14N,50; Nov 35.

Moisture measurement
Jul 49.

Monitors and alarms
Mar 50; Apr 46; Jul 16N,51,56; Aug 33,49; Sep 74; Oct 35,39; Nov 12N,31; Dec 41,45.

Multiplexing
Sep 65; Oct 39; Nov 5N; Dec 45,50.

Patents
Feb 44; Mar 50; Apr 12N; May 5N,52; Jun 52; Jul 56; Aug 49; Sep 74; Oct 53; Dec 50.

pH measurement control
Mar 45; Apr 35; Jun 52.

Photometrics
Apr 41; Jun 50,52.

Pollution control
Jan 43; Feb 9N,27; Mar 50; Apr 21N,35,41; Jun 45,52; Jul 16N; Aug 7N,16N; Sep 14N,74; Dec 20N.

Pressure
Apr 7N,43,46; Aug 49; Dec 30.

Professional data
Feb 25; Apr 12N; May 5N,16N,38; Jun 10N,26; Sep 9N

Programming (see Computer programming)

Radiation gages
Feb 32; Sep 60.

Recorders
Feb 44; Aug 49.

Reliability
Mar 10N; Jun 31; Oct 53; Nov 27.

Remote sensing
Feb 27; Jul 16N; Dec 45.

Safety
Mar 50; Apr 12N,52; May 50; Jun 31,50; Jul 51,56; Aug 16N,33,48; Oct 7N,35,52; Nov 31; Dec 45.

Sampling
Jan 43; Mar 37; Jun 36,45; Dec 45.

Sensors (see specific entries under Analyzers, Radiation gages, Strain gages, Thermocouples, Transmitters; or refer to specific variables such as Flow, Level, etc.)

Sequencing (see Batch control)

Signal conditioning
Jan 39; Feb 36,39; Apr 52; May 29,42; Sep 65,74; Oct 35,53; Nov 31.

Simulation
Feb 39; Apr 7N,35; Aug 7N; Oct 39.

Spectral analysis
Feb 32; Mar 50; June 36; Sep 74.

Standards
Feb 9N,27; Mar 10N; Apr 12N,21N,41; May 16N; Jun 7N; Jul 16N,22N,33; Aug 16N,41; Sep 14N,60; Oct 7N,14N,46,50; Nov 5N,35; Dec 20N.

Strain gages
Apr 46; Aug 38.

Switching
Jun 31,52; Jul 49,56; Aug 48; Sep 49; Oct 35,53; Nov 31.

Temperature
Jan 33; Apr 52; Jul 56; Aug 41; Oct 50; Nov 18N,31,35.

Test measurements
Mar 37; Apr 7N,46,52; May 52; Jul 49,51; Aug 14N,48; Sep 65; Oct 46,50,52,53; Dec 45.

Theory (see Control systems theory)

Thermocouples
Aug 41; Oct 14N,50; Nov 35.

Thermoelectric techniques
Jan 33; Mar 37; May 50; Oct 50.

Timing
Jun 36; Aug 48,49; Oct 14N.

Transmitters
Jan 39; Feb 36; Mar 29; May 35; Aug 38; Sep 49; Oct 35,39,53; Nov 27,31,40; Dec 30,45.

Ultrasonics
Jan 10N; Sep 49,74; Oct 14N.

Unit operations
Jan 39; Feb 36; Mar 39; Apr 7N,8N,45; Jun 31; Jul 16N; Aug 38; Dec 50.

Valves
May 52; Jun 50; Jul 33; Oct 46; Dec 50.

Vibration
Apr 46.

Viscosity
Apr 43; Nov 31.

Wiring and cable
Mar 49; Jun 31; Aug 33; Sep 65; Oct 39; Nov 5N; Dec 45.

Engineers

Instrument Selection & Application, Project, Electrical & Instrument Maintenance, Plant Engineering, Process Control.

We are a professional recruiting and consulting firm managed by graduate engineers. Our client companies pay all our fees. Send resume or request our free resume kit.

Scientific Placement, Inc.

EMPLOYMENT SERVICE, DEPT D /2700 SOUTH POST OAK ROAD/GALLERIA/HOUSTON, TEXAS 77027 A.C. 713/621-9811

IT 12/74

GRAPHIC PANEL WORK

— New Installation
— Modification
— Renewal or Repair

PANELLIT SERVICE CORPORATION
7401 N. Hamlin Ave.
Skokie, Illinois 60076
(312) 675-2500

PROJECT INSTRUMENT ENGINEER
Dynamic medium-sized refinery consulting firm seeks Instrument Engineer (ChE, ME or EE) with 3 yrs. minimum experience in refinery or petrochemical controls. Will work with clients, process engineering, vendors and field construction groups. Houston. To $24,000 +.

STAFF INSTRUMENT ENGINEER
BS Engineering and a min. of 3 yrs. design and construction of plant process controls systems. Some computer interface exp. would be helpful. Will be assigned as Inst. Engr. on large projects ($100MM+) with responsibility for design, contractor selection, vendor liaison, etc.

ELECTRICAL PROJECT ENGINEERS
BSEE and 3-15 yrs. design, constn. and maint. of high voltage dist. systems, large elect. machinery and control systems for process equip. Junior openings as well as supervisory levels. Will handle variety of large $ projects in utilities and oil processing facilities. $15-23,000 base.

AREA MAINTENANCE ENGINEER
Instrument and Electrical Engineer with BS Engr. plus a min. 5 yrs. maint. experience in oil production/refining, or chemical plant. Will be assigned area responsibility for all I and E Maintenance and construction. $1,500-1,800/Mo.

The above openings are for a large US-owned oil co. overseas with giant expansion programs now underway. Co. provides "Americanized" living conditions, good schools, etc., and offers unique plan which allows ability to save most of annual base salary.

SR. INSTRUMENT SPECIALIST
Central engineering dept. of growing oil, gas, petrochemical and mining, co. with over $500MM of approved projects just starting in design phase, seeks a BS Engr. with a min. 5 yrs. experience who can take complete charge of instrumentation design, specification, and startup. Will work very closely with process engineers and apply latest control technology to new processes, consult with operations dept. on procedures, and provide consulting service during plant startup. Texas. $1,800/Mo.

FEES PAID
Send resume or write for free Resume Guide to Ronnie Boyd BSME/MBA, Bill Prim BSME.

Ronnie Boyd & Associates
Placement Consultants
The Main Building (713) CA 7-3103
1212 Main, Houston, Texas 77002

Articles **Page**

January
Cryogenic Temperature Sensors 33
Calibrating Boiler Control Systems 39
Poilution Analyzers for Air and Water —who makes what 43

February
Maintaining Technical Excellence in a Changing Environment (Essay) 25
Global Pollution Monitoring 27
Analyzing Process Systems by Neutron Activation 32
Feedforward Control Strategy for Distillation Towers 36
A Process Simulator That's Portable 39
Recorder Trace Identification 44
Flueric Sensing of Gas Concentration 44

March
Electromagnetic Flowmetering 29
A Combustion Efficiency Monitor for Automobile Engines 37
Putting Programmable Controllers to Work on Material Handling 39
Limitations of Conductivity Measurement 45
Electrostatic Shields for Cables 49
Pneumatic-electric Overheat Monitor 50
Analyzer Detects Emission Lines 50

April
Waste Neutralization Control 35
Standards for Pollution Analyzer Performance 41
A Bourdon-tube Viscometer 43
Compressor Instrumentation Systems 46
Finding the Duty Cycle of a Relay Coil 52
Current Limiting Circuit 52

May
Material Balance Control in Recycle Systems .. 29
Rack Enclosures for Field Instruments 35
Summer-Fall Short Course Roundup for Managers, Engineers and Technicians 38
A Computer-coordinated Bleach Plant 42
Metallic Powder Flowmeter 50
Microresonator Dampens Flow Oscillations 50
Flotation Measurement and Control 52
Sanitary Butterfly Valve 52

June
Paper Talks (Essay) 26
Backup Alternates for Computer-controlled Batch Polymerizers 31
Amplitude-Frequency Description 36
Determining Level Control Stability 41
How to Calibrate Ambient Air Monitors 45
A Chemical Seal for Emergencies 50
Light Detector for the Blind 50
A Bolometer Made of Chalcogenide Glass 52
Adaptive Control for Nonlinear Processes 52

July
Control Valve Sizing with ISA Formulas 33
A Humidity Element That Switches 49
Monitoring the Integrity of Vessel Linings 51
Don't Live with Reset Windup 55
Failsafe Thermostatic Switch 56
Flowmeter for Dust-laden Gases 56

August
Gas Detectors by the Acre 33
Low Range Flowmeter for Pulverized Solids ... 38
Thermocouple Calibration and IPTS-68 41
Optimized Maintenance Spending Increases Profits 44
The Great Zero Crossover Hoax 48
Event-sequence Detector 48

September
Ultrasonic Instruments for Level and Flow 49
Control System Design for Nuclear Power 60
Microcomputers for Data Acquisition 65
Computer Maintenance Practices 70
Real-time Fourier Transformation System 74
Acoustic Particle Detector 74

October
How to Instrument Fuel Oil Systems—Part I .. 35
Design for Computer Control 39
Control Valve Noise Rating: Prediction vs Reality 46
Stabilization of Metal-sheathed Thermocouples 50
Turbomachinery Clearance Indicator 52
Error-rejecting Digital System 53
Circuitry for Slip Rings 53

November
Improving Instrument Service Factors 27
How to Instrument Fuel Oil Systems—Part II . 31
Superconductive Fixed Points for Cryogenic Thermometry 35
An Explanation of Zero and Span 40

December
Differential-pressure Instruments: The Universal Measurement Tools 30
Managing Plant Utilities 41
Data Acquisition in Coal Mines 45
Ball Valve with Porous Ball 50
Adapter for Computer and Programmable Controller 50

Authors **Issue, Page**

Ackley, W. R. ..... Feb 36
Aldridge, M. D. ..... Dec 45
Anderson, A. G. ..... Feb 25
Arant, J. B. ..... Apr 46
Ash, R. H. ..... Apr 35
Austin, O. R. ..... Jul 51

Bard, J. E. ..... Oct 50
Bolton, M. S. ..... Mar 37
Bretthauer, E. W. ..... Feb 27
Britton, R. E. ..... May 35
Brosz, J. ..... Mar 49
Brown, D. L. ..... Sep 60
Buckley, P. S. ..... May 29
Buntzel, Jr., H. ..... Jan 39

Cason, R. L. ..... Aug 44
Chapman, R. L. ..... Apr 41
Cho, C. H. ..... Jun 41
Coelho, W. A. ..... Mar 39
Crawford, W. A. ..... Apr 46

Deka, D. K. ..... Nov 40
Driskell, L. ..... Jul 33

Farrar, D. ..... May 42
Fournier, C. D. ..... Apr 35
Freedman, B. ..... May 42

Gottensohn, A. E. ..... Apr 52

Hall, C. J. ..... Jul 55
Holst, P. A. ..... Feb 39
Hubbard, R. M. ..... Apr 43

Isogai, H. ..... Jul 49

Johanson, K. A. ..... Aug 33

Kaminski, R. K. ..... Jun 50, Sep 49
Kennedy, R. H. ..... Aug 41
Kostiw, W. B. ..... Oct 35, Nov 31

Lawford, V. N. ..... Dec 30
Lipták, B. G. ..... Jan 43, Sep 49

Marcikic, S. ..... Apr 35
Mayfield, R. P. ..... Jun 31
McKinley, J. J. ..... Jun 45
Melfi, S. H. ..... Feb 27
Morgan, G. B. ..... Feb 27

Papadatos, K. ..... Aug 38
Park, W. H. ..... Jun 36
Powell, D. ..... May 42
Preston, P. J. ..... Apr 43
Putman, R. E. J. ..... Oct 39

Rhodes, J. R. ..... Feb 32
Richter, J. D. ..... Apr 35
Rose, C. W. ..... Sep 65

Scalla, V. ..... Nov 27
Schoeffler, J. D. ..... Sep 65
Schooley, J. F. ..... Nov 35
Scull, W. ..... Oct 46
Seymour, G. ..... May 42
Shinskey, F. G. ..... Jun 26
Smith, Jr., N. S. ..... Dec 45
Soulen, Jr., R. J. ..... Nov 35
Svrcek, W. Y. ..... Aug 38
Swartwout, R. E. ..... Dec 45
Swartz, D. L. ..... Jan 33
Swartz, J. M. ..... Jan 33

Taylor, D. S. ..... Mar 37
Taylor, M. C. ..... Feb 32
Thomas, E. U. ..... Aug 48

Wakabayashi, T. ..... Jul 49
Wambold, J. C. ..... Jun 36
Webb, A. S. ..... Mar 29
Wiik, E. ..... Dec 41

Young, I. G. ..... Mar 45

FLUOR ENGINEERS AND CONSTRUCTORS
HOUSTON DIVISION
is looking for an

INSTRUMENTATION ENGINEER

Who can be responsible
for application & specification

ELECTRONIC/PNEUMATIC INSTRUMENTATION

Must have degree
and experience in
the Petrochemical/refinery
Processing Industry.

This is a **CAREER POSITION** that has been necessitated by increased activity in the Energy Industry.

FLUOR ENGINEERS AND CONSTRUCTORS INC.

CONTACT:
C. Aschwege
4620 N. Braeswood
Houston, Texas 77035
(713) 668-9241